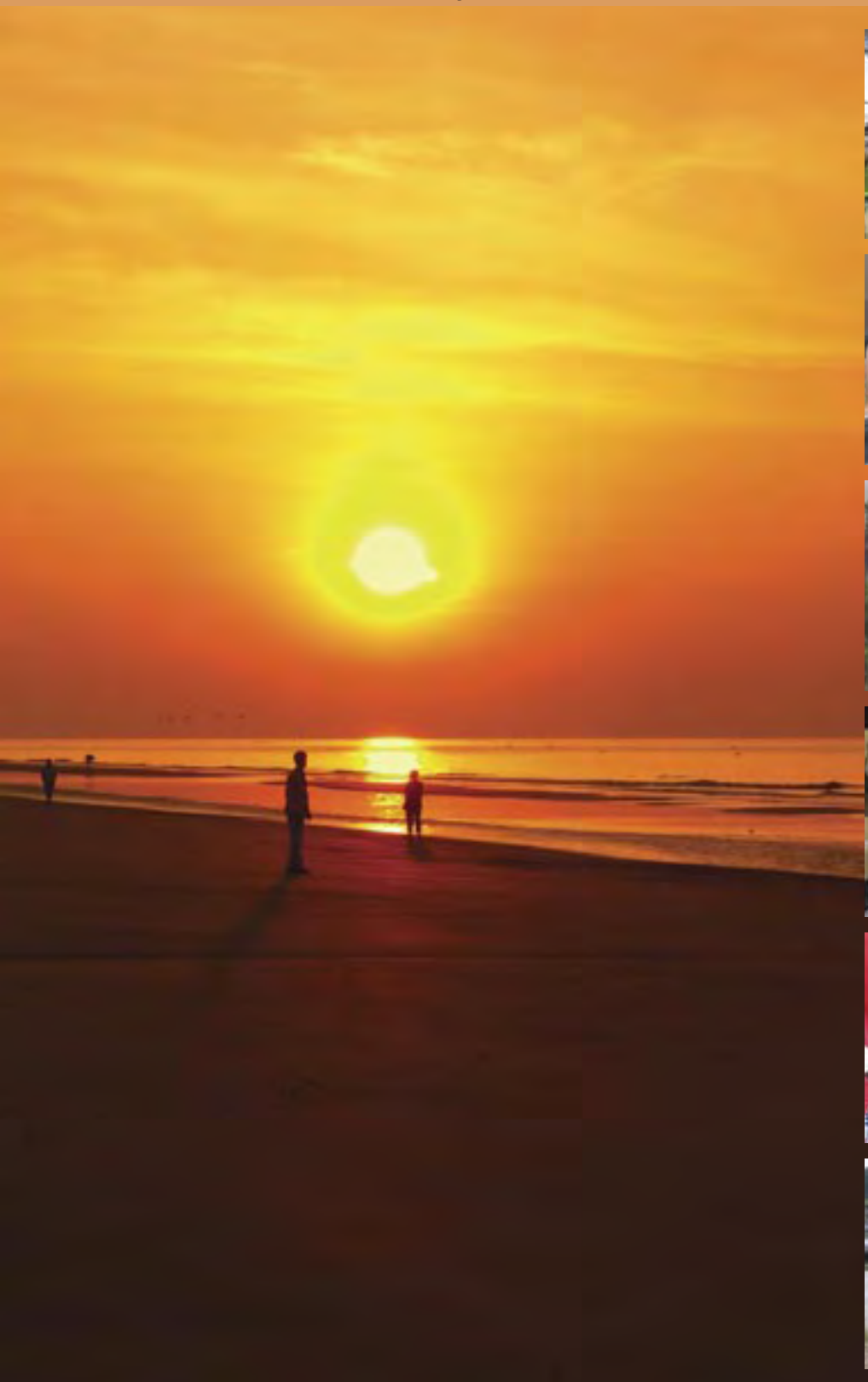
Clemson IMPACTS

Clemson University Public Service Activities

Summer 2006



Research solves coastal turfgrass mystery

Lake City teachers and students connect with their roots

Summer wildfire forecast

Study tests safety and quality of medicinal plants

Camp Happy Days brightens summer for young cancer patients

Biosystems engineer earns research award

Letter from the Vice President

Farmers are increasing crop production while using fewer chemical pesticides with the help of biological controls. Clemson scientists are working to make these biological controls more efficient through innovative processes.

Hurricane Katrina victims waited days for relief to arrive by air or land. For future disasters, a Clemson transportation policy consultant proposes outfitting relief ships that could reach ports within hours of a hurricane's landfall.

Maritime industries are faced with a billion-dollar problem caused by barnacles and other sea life that attaches to underwater surfaces. A Clemson marine biologist has discovered a promising treatment by studying the biochemical signal that oysters use to repel hangers-on.

There are no established standards for quality or safety in herbal medicines such as feverfew or Echinacea, known as nutraceuticals. A Clemson post-harvest physiologist is developing methods to test for bacterial content in the commercial products and the harvested plants used to produce them.

Selected members of 4-H can enhance leadership and communication skills in a new statewide program that begins this fall. The 4-H Ambassador Training program will serve both teens and adult volunteers, with an emphasis on public speaking.

Early childhood development programs are economic development programs because they improve the quality of the future workforce and create tremendous cost savings for society. This statement was made by a Federal Reserve Bank economist at a meeting of business leaders hosted by Clemson social scientists.

These are some of the Clemson Public Service programs you'll find in this issue.

Sincerely,

John W. Kelly

John W. Kelly
Vice President for Public Service and Agriculture

Knowledge for living. Knowledge for life.

CLEMSON PUBLIC SERVICE

Clemson Impacts, a quarterly publication of Clemson Public Service Activities, is available to South Carolina residents upon request. *Clemson Impacts* is also available on the web *www.clemson.edu/public/*

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Printed on recycled paper with soybean oil-based ink.

Cover photo by Tom Lollis

State leads Southeast in summer collards

By Tom Lollis

Photo by Tom Lollis

Collards aren't just for New Year's Day anymore. "South Carolina is the nation's number two collard producer behind Georgia, and is the major area in the Southeast that produces collards year round," said Powell Smith, Clemson Extension vegetable entomologist.

"The state produces about 4,200 acres of collards in the state, with more than 3,000 in Lexington County," Smith said. He works closely with major producers to help them manage diseases, insects, nutrients and the use of cover crops. As a result, consumers get vegetables produced with fewer pesticides.

Currently his research team is working with the two largest growers, W. P. Rawl & Sons and Clayton Rawl Farms, to seek solutions to bacterial leaf spot. The disease causes losses of about $1.5 million a year in Lexington County. Good crop rotation is essential because no chemical control options are available.

The team screened more than 700 collard types looking for resistance to the disease. They identified four lines that show promise. Now breeders at the USDA Vegetable Laboratory in Charleston are working to develop new disease-resistant varieties that may be available to growers in the next few years.

For more information: Powell Smith at 803-284-3343, ext.228, jpsmth@clemson.edu.

Scientists seek to protect biological controls of pests

By Tom Lollis

Photo by Tom Lollis

Biological controls reduce dependence on chemical insecticides, but one limiting factor is that they are easily broken down by sunlight. Clemson plant scientists are looking for ways to extend the effective life of these natural pest controls.

Entomologists Merle Shepard and Martin Shapiro are testing organic materials as sunscreens or activity enhancers for a virus that can control the beet armyworm. Viruses are widely used for pest control in developing countries. They do not work as quickly as the insecticides commonly used in the United States, but they target specific pests without harming beneficial insects.

Last year a visiting scientist from the University of Cairo screened more than 70 potential virus enhancers at Clemson's Coastal Research and Education Center in Charleston. A high percentage showed promise as virus protectors. Shepard and Shapiro are now screening the efficacy of these products by using various concentration levels and exposure times to ultraviolet rays.

Many of the plant materials are found in the average kitchen, such as ginger, paprika, black pepper, nutmeg and sage. Others are nutraceutical plants such as catnip, garlic, dandelion and slippery elm.

For more information: Merle Shepard, 843-402-5393, mshprd@clemson.edu.

Homeowners now can mail in soil samples

By Diane Palmer

Homeowners can now get recommendations for home garden soil improvements through the mail. The convenient new soil sample mailer includes a soil-sample bag, instructions on how to take the sample and a postage-paid shipping envelope. Results are mailed back about 10 days after the sample is received.

"Soil sample results recommend what is needed to grow healthy flowers, vegetables, shrubs or lawns based on the homeowner's soil conditions," said Kathy Moore, director of Clemson's Agricultural Service Laboratory. For example, different types and amounts of fertilizer might be required to grow vegetables versus lawns.

The mailer costs $15 and can be ordered online at www.clemson.edu/psapublishing/. Homeowners may also pick up a soil-sample bag at their county Clemson Extension office and return the sample to the Extension office or to the Agricultural Service Laboratory for $6.

For more information: Kathy Moore, 864-656-2300, kmr@clemson.edu.

Photo by Tom Lollis

Research solves coastal turfgrass mystery

By Tom Lollis

Coastal golf course superintendents are taming a new turf disease called rapid blight with help from a Clemson plant scientist. Bruce Martin, turf pathologist at Clemson's Pee Dee Research and Education Center in Florence, helped identify the cause and treatment for the disease.

He worked with superintendents at the Ocean Course on Kiawah Island, a North Myrtle Beach golf course, and others to solve the mystery of brown patches that had appeared on their putting greens. "We couldn't find any evidence that we would typically see with a fungus," said Martin.

The culprit turned out to be a land relative of an ocean-dwelling slime mold. The new organism, called *Labyrinthula terrestris*, thrives in areas where soils and water have a high salt content.

Martin helped identify fungicides that work to control rapid blight. He also developed management strategies for reducing the effects of salts on golf course turfgrass. These strategies help protect the state's $1.5 billion golf-related tourism industry. In the Grand Strand alone, a 60-mile stretch from Myrtle Beach to Georgetown County, 4.3 million rounds of golf are played on 120 golf courses each year.

Research on the mold will continue since it could become a problem on other plants, especially as the growing population puts pressure on both water quality and quantity in coastal areas.

For more information: Bruce Martin 843-662-3526, ext. 234, sbmrtn@clemson.edu.

Variable rate system helps protect cotton crops and the environment

By Tom Lollis

Photo by Tom Lollis

A variable-rate application system, developed by Clemson scientists, allows cotton farmers to apply fewer chemicals to control nematodes, thereby saving money and protecting water quality.

Nematodes are the most numerous multicellular animals on earth. A handful of soil will contain thousands of the microscopic worms, many of them parasites of insects, plants or animals. The site-specific nematicide placement project is a two-year cooperative effort with the University of Arkansas, led by Ahmad Khalilian, agricultural engineer at Clemson's Edisto Research and Education Center in Blackville.

Clemson scientists divided each field into three zones, applying a nematicide conventionally and at variable rates based on global positioning system mapping of soil types. The satellite maps show the exact locations of light, sandy soils that nematodes prefer. Treatment is applied to these areas but not to heavier, organic soils that are less likely to contain nematodes.

Researchers expect farmers to reduce their use of nematicides by as much as one-third by using the variable rate system. This will reduce production costs and protect groundwater quality.

For more information: Ahmad Khalilian, 803-284-3343, ext. 230, akhlln@clemson.edu.

Lake City teachers and students connect with their roots

By Kathy Woodard

Photos by Michael Moore

The tobacco industry was the center of culture in Lake City for decades, yet many of the area's young people do not understand its importance to the culture, economy and history of their community. Beth Wright, district superintendent, and Patricia Chandler, director of instruction for Florence County School District 3, worked with Clemson's Service Alliance to change that.

They proposed a research project to connect middle and high school students to their roots while it improved their study skills and encouraged them to consider higher education. The project, "Student Participation in Community Research: The Rise and Fall of Tobacco in the Lake City Market Area", was funded through Clemson's Service Alliance and included a tour of Clemson's Pee Dee Research and Education Center in Florence.

"I learned more about my family's history and the financial problems related to the fall of the tobacco market," said Joel Graham, a Clemson student and Lake City resident who assisted with the research.

For more information: Barbara Speziale, 864-656-1550, bjspz@clemson.edu.

Send hurricane relief by sea

By Peter Kent

The ocean is a natural highway, essentially unaffected by hurricane destruction. "While the sea may be impassable at certain times and locations, it recovers quickly, which isn't always the situation with land transportation systems after a disaster," said Clinton Whitehurst Jr., a senior fellow at Clemson's Strom Thurmond Institute of Government and Public Affairs and lead author of *Hurricane Relief from the Sea.*

No matter where a hurricane makes landfall, there are deepwater seaports close to the disaster area that can accept relief supplies delivered by sea. A pre-loaded relief ship could reach a disaster area 12 to 36 hours after a storm. By comparison, it took three to five days for significant relief to reach New Orleans by land and air after Hurricane Katrina.

The ships can rely on their own power when electricity is not available on-shore. They can also be adapted for specialized duty, such as providing emergency medical or communications centers, feeding and housing victims and relief personnel, accommodating rescue helicopters and even supplying power to land-based units.

For more information: Clint Whitehurst, 864-656-4700, clint@strom.clemson.edu.

Doctoral program strengthens communities

By Kerry Coffey

A new doctoral program in family and community studies begins in fall semester, offered through Clemson's Institute on Family and Neighborhood Life. "The goal of the program is to educate gifted students from all over the world as insightful scholars, inspiring teachers, creative leaders and, perhaps most importantly, dedicated humanitarians," said Gary Melton, director of the institute.

There is no other program like it in the nation. Half the students will be from the U.S. and half from other countries. They will spend one academic year outside North America studying at a center affiliated with the institute. They will participate in institute projects on community development, policy consultation and empirical research in South Carolina, as well as other states and countries.

For more information: www.clemson.edu/ifnl/ or Bonnie Holaday, 864-656-6288, holaday@clemson.edu.

Biochemical research may help repel barnacles

By Peter Kent

While seeking to unlock the secrets of how oysters make their shells, marine biologist Andy Mount discovered a promising treatment for a billion-dollar problem in maritime industries.

He hypothesized that the calcification part of the shell-making process might enable sea creatures to colonize an underwater surface. Called bio-fouling, the barnacles, mussels and algae that cling to undersea surfaces cause shipping companies, boatyards, offshore oil rig operators, fish-farming operations, undersea pipeline and cable companies to spend more than $1.4 billion a year.

Traditional remedies have been to either scrape surfaces or to chemically coat them. Scraping is an expensive, temporary answer, and chemical coatings can harm the environment.

Mount's research, funded by the U.S. Navy's Office of Naval Research, focuses on the biochemical signal that oysters transmit to repel hangers-on. "The research holds promise for development of advanced materials and biomedical companies within our state," he said.

For more information: Andy Mount, 864-656-3597, mount@clemson.edu.

Summer wildfire forecast

By Stephanie Beard

Photo by S.C. Forestry Commission

Although western wildfires dominate the news during the summer, the climate in South Carolina creates a different fire season here. Summer wildfires can occur in the state, especially if there is a drought. However, our wildfires are most likely to occur from January through April.

Each year, the state averages about 4,000 fires that burn about 24,000 acres, according to the S.C. Forestry Commission. Summer fires (June through September) traditionally make up only about 15% of the total.

No matter where you live or what the season, the best defense against wildfires is prevention. For this reason, Clemson forestry scientists use prescribed fire to reduce combustible materials in University-managed forests at the Baruch Institute in Georgetown and the Experimental Forest on the main campus. They also conduct demonstrations for forest landowners on the use of prescribed fire and other management practices to ensure safe and healthy forests.

The S.C. Forestry Commission offers guidelines for homeowners to protect their house from wildfires at www.state.sc.us/forest/fpro.htm.

Photo by Tom Lollis

Biologist whips up native wildflower recipe

By Tom Lollis

When T. J. Savereno set out to plant native wildflowers at the Pee Dee Research and Education Center, he had to build his own seed mix. The Clemson University wildlife biologist found many mixes that would flourish; but most contained non-native species, including Siberian wallflower and Chinese forget-me-not.

"I prefer native species," said Savereno. "They adapt well to local conditions and are more resistant to local diseases and pests. They also are less likely to escape from gardens and displace native species in the wild."

Savereno chose 14 native plants: including prairie blazing star, lance-leaved coreopsis, butterfly milkweed, pale purple coneflower, Maximillian sunflower, black-eyed Susan, dense blazing star, Illinois bundleflower, biannual evening primrose, showy goldenrod, wild blue lupine, golden Alexanders, Indian blanket and partridge pea. He also included non-native crimson clover because it sprouts quickly, helps hold soil and increases soil fertility.

For more information: T. J. Savereno, 843-662-3526, ext. 250, asavere@clemson.edu.

New classroom is as big as all outdoors

By Tom Lollis

The newest classroom at Clemson's Pee Dee Research and Education Center in Florence is as big as all outdoors. The Outdoor Education Trail offers visitors a close-up look at the natural resources of South Carolina's Pee Dee region and tips on how to be good stewards of the environment.

Learning centers are being developed to display various ecosystems such as agricultural lands, forests, wetlands, a lake and even urban environments, according to Jim Frederick, a Clemson agronomist and project leader. The completed centers will feature both learning kiosks and demonstrations for innovative cropping systems, wildlife management, longleaf pines, crops, water quality, forest resources, American Indian culture, wildlife-friendly plants for the yard, and more.

The mile-long trail may be visited by invitation only for now, but it should be open to the public by spring. Hiking trails around the 150-acre Dargan's Pond are planned, as well as a canoe trail on the pond.

For more information: Jim Frederick, 843-662-3526, ext. 228, jfrdrck@clemson.edu.

Photo by Tom Lollis

Photo by Stephanie Beard

Junior Naturalist camp develops young environmentalists

By Stephanie Beard

Elementary and middle school children learned about forests, wildlife and wetland resources this summer at Clemson's Belle W. Baruch Institute of Coastal Ecology and Forest Science in Georgetown.

The Junior Naturalist program was held in two four-day camps that used both indoor and outdoor activities to teach children about the benefits people derive from nature, including clean air and water, recreation, and forest products. The campers also learned what they can do to help take care of natural resources so that they can continue to enjoy these benefits.

Participants measured tree height, diameter, and determined the age of trees by taking core samples. They also learned how to identify plants using a plant key. The program focused on Lowcountry habitats, including longleaf pine forests, swamp forests, and salt marshes.

For more information: Stephanie Beard, 843-546-1013, ext. 235, slbeard@clemson.edu.

Master Gardeners fund college scholarships

By Diane Palmer

Aiken County Master Gardeners are raising money for college scholarships while they solve homeowners' lawn and garden problems. For a $50 donation, a five-person team of certified Master Gardeners will make a house-call and provide written recommendations for gardening solutions.

Called "Rent-A-Master Gardener," all consulting fees fund scholarships for needy students. The Master Gardeners program, administered by Clemson Extension, provides intensive training in home horticulture in exchange for volunteer service to communities.

For more information: Aiken County Extension office 803-649-6297, ext 122.

Keep pesticides high and dry

By Peter Kent

The 2006 hurricane season looks to be an active one. Bob Bellinger, Clemson Extension pesticide safety educator, offers some advice for homeowners in storm-prone areas: "Keep your pesticides high and dry."

Last year Hurricane Katrina caused tremendous devastation, which was made worse by lawn and garden pesticides that mixed with flood waters, creating a toxic gumbo.

Store pesticides on high shelves and, better still, put them in a waterproof plastic container or line a box with a plastic bag and tie it securely. Clearly mark the box as pesticides and leave all labels on the products.

"Also remember the most important six words on pesticide label: Keep Out of Reach of Children," said Bellinger. Extension agents are located throughout the state to help homeowners select and handle pesticides safely.

For more information: Bob Bellinger, 864-656-5042, bbllngr@clemson.edu, or http://entweb.clemson.edu/pesticid/saftyed/storage.htm.

Study tests safety and quality of medicinal plants

By Tom Lollis

A Clemson plant scientist is studying medicinal plants, or nutraceuticals, to see whether manufacturers are providing a safe, quality product. Nutraceuticals are not currently regulated by the U.S. Food and Drug Administration. No formal standards for safety or quality of active ingredients exist, meaning that individual companies are free to set their own standards.

Jim Rushing, post-harvest physiologist at the Coastal Research and Education Center in Charleston, has begun to analyze the bacterial content of commercial products and of medicinal plants grown at the center.

If he discovers harmful bacteria, the next step is to test methods to eliminate them. Irradiation seems the best option, the same way that spices are sterilized. Chemical fumigation is another option.

"Any treatment will have to preserve the active ingredient in the plant material," said Rushing. "For example, feverfew is used for migraine headaches. The active ingredient is parthenolide. If we sterilize the product but destroy the parthenolide, we accomplish nothing," said Rushing.

For more information: Jim Rushing, 843-571-4654, jrshng@clemson.edu.

Photos by Tom Lollis

Cooking with a Chef encourages good health

By Peter Kent

A free, hands-on program, called Cooking with a Chef, provides quick, nutritious and delicious menu ideas for limited resource families with preschool children. A chef works side-by-side with participants to prepare healthful, kid-appealing meals while a nutrition educator leads a conversation about wise food choices.

"We initiated the collaboration with Share Head Start in Greenville four years ago to encourage families to eat more fruits and vegetables, to cook at home, and to enhance their cooking confidence," said Marge Condrasky, a registered dietician at Clemson and one of the program leaders.

With support from the Centers for Disease Control the program expanded to preschools in Spartanburg County last year. This year, research funds from the University extended the program to Anderson County.

Fresh produce for the program is donated by the BI-LO grocery chain and canned goods are donated through Department of Social Services Family Nutrition Programs.

For more information: Marge Condrasky, 864-656-6554, mcondra@clemson.edu.

Nutrition resources are now online

By Diane Palmer

Consumers are bombarded with nutrition and diet information every day. This information overload often leads to requests for clarification from nutrition educators.

To help educators and consumers keep abreast of the latest information, Clemson food and nutrition scientists have created an online educational resource center called Nutri-Web. Materials can be used by both nutrition educators and consumers.

Developed by food and nutrition professor Katherine Cason, the website includes numerous free fact sheets and other publications that can be downloaded and printed. It also has a lending library and links to many other nutrition websites.

For more information: Katherine Cason, 864-656-0539; kcason@clemson.edu or www.clemson.edu/nutriweb/.

Camp Happy Days brightens summer for young cancer patients

By Pam Bryant

Nearly 200 young campers and a host of volunteers come to Camp Happy Days for fun and adventure each year during July 4th week. During this time, the R.M. Cooper 4-H Leadership Center in Summerton is transformed into a magical place for children with cancer and their siblings.

This year, some children came knowing it could be their last time, yet their spirits couldn't have been higher as they enjoyed the circus-themed camp complete with a flying trapeze, an elephant, tiger cubs and clowns. It was a chance for them to escape their everyday world of medical treatments and feeling self-conscious because they have lost their hair.

Most of all, Camp Happy Days is a time for carefree laughter and loads of fun. The program is operated by Clemson's Youth Learning Institute in partnership with Happy Days and Special Times, a non-profit organization based in Charleston that serves children with cancer and their families, www.hdstkids.org/.

For more information: Pam Bryant, 803-553-7705, pbryant@clemson.edu, or www.clemson.edu/yli/.

Coastal camp makes learning *fun*

By Pam Bryant

"I didn't know marine science could be so much fun," said Aiyanna Drayton, a rising eighth grader from Columbia. "We kayaked, went tubing and crabbing, and took a boat to the barrier island to learn about plants and animals. At night, all the campers sang and played games with our counselors. Tubing was my favorite."

For seven summers, boys and girls like Aiyanna from all over the U.S. have experienced the beauty and magic of South Carolina's coast at Camp Sewee. The marine science camp is operated by Clemson's Youth Learning Institute at the Sewee Coastal Retreat Center on the intracoastal waterway in Awendaw.

Camp Sewee engages campers in studies of island ecology, marine wildlife, water quality, a fouling lab, raptor rehabilitation demonstrations, orienteering and plant identification. Plus, there's plenty of fun through tubing and kayaking in the marsh, and trips to the S.C. Aquarium and a water park near Charleston.

Camp Sewee is a partnership of the Youth Learning Institute, the S.C. Sea Grant Consortium, the S.C. Department of Natural Resources and Clemson Extension.

For more information: 864-878-1041, www.clemson.edu/yli/campsewee/.

Collaboration prepares teachers to help underachieving students succeed

By Pam Bryant

Many students labeled "at-risk" do not lack intelligence, they simply do not learn well through traditional teaching methods. This leads to a downward spiral of disruptive behavior when they don't succeed. Helping teachers transform these students into engaged learners in South Carolina's classrooms is the goal of a collaborative partnership between Clemson University, Columbia College, and the S.C. Department of Juvenile Justice (DJJ).

Clemson's Youth Learning Institute operates the Youth Development Center in Aiken, an alternative placement facility for first-time youthful offenders, in partnership with DJJ. Disruptive behavior in school is a common violation among youth at the center, and many have a history of failure in traditional classroom settings.

Columbia College has developed a groundbreaking master's of education program in "divergent learning" that focuses on alternative teaching methods for at-risk youth. This fall, a group of the graduate students will teach classes at the Youth Development Center using alternative methods to help the younger students succeed.

"This partnership will benefit the state of South Carolina and youth who learn best through creative, out-of the-box teaching methods," said DJJ Director Bill Byars. "Reaching them before they enter the juvenile justice system is critical. We are very grateful to Clemson University and Columbia College for their ongoing assistance to address this need."

For more information: Stephen Lance, 803-414-1735, slance@clemson.edu, or www.clemson.edu/yli/.

4-H Ambassador training builds teens' communication skills

By Diane Palmer

Photo by Shannon Herndon

Teens across the state will enhance their leadership and communication skills through a new 4-H Ambassador Training program beginning this fall. The program will train approximately 50 ambassadors, age 14 and up, who are selected from across the state.

It will build on skills learned in local and county-wide programs, with emphasis on public speaking.

"Two intensive one-day training sessions will be held in October and November with about 25 participants each," said Amy McCune, 4-H events coordinator. The statewide program will be held at Clemson's Sandhill Research and Education Center in Columbia and is open to adult 4-H volunteers as well as teens.

Participants in the ambassador program will develop an action plan to apply their new leadership and communication skills. They will work with their county 4-H leader to implement their plan during the coming year. Applications will be accepted in September through the Clemson University Cooperative Extension office in each county or online at www.clemson.edu/4h/.

For more information: Amy McCune, (864) 656-6651, amccune@clemson.edu or www.clemson.edu/4h/.

Early childhood development is economic development

By Peter Kent

Rob Grunewald, noted economist at the Federal Reserve Bank of Minneapolis, is a passionate advocate of quality early childcare and education initiatives. "Early childhood development is economic development because it improves the quality of the future workforce and creates tremendous cost savings for society," Grunewald said.

He spoke to Upstate business and community leaders in May, at the request of Janet Marsh, research associate in Clemson's Institute on Family and Neighborhood Life. Marsh's research has shown that children who attend early childhood development programs tend to have higher school readiness scores than those who do not. Further, children who attend high-quality programs tend to be better prepared for school than those who attend programs of lesser quality.

"It is important that high-quality childcare be available to both single-parent and two-parent families so our state's children are prepared to succeed in school and in life," Marsh said.

For more information: Janet Marsh, 864-656-0229, jmarsh@clemson.edu.

Biosystems engineer earns research award

By Peter Kent


Photo by Debbie Dalhouse

Biosystems engineer David E. Brune was selected for the 2006 Godley-Snell Award for Excellence in Agricultural Research. Each year, one Clemson scientist receives the honor for research that makes an outstanding contribution to improve the lives of South Carolinians.

In 1987, Brune launched a groundbreaking research program to modify traditional fish-farming by using a new design called the partitioned aquaculture system (PAS). The research has become an interdisciplinary effort involving faculty, staff and graduate students in three academic areas.

Clemson's aquaculture team has demonstrated that the process can produce catfish yields three to four times higher than conventional methods, using one-eighth as much water. The process has been patented and is used by commercial growers in the U.S. and several foreign countries, as well as by other agricultural experiment stations around the nation.

Now, Brune is using the system to raise shrimp. The process not only increases production but also treats the waste and restores the system's water quality. He also is studying how algae can be used to generate energy.

For more information: David Brune, 864-656-4068, debrune@clemson.edu.

Clemson helps Taiwan control fire ants

By Tom Lollis


Photo by Tom Lollis

When fire ants were discovered in Taiwan in 2004, one of the first places they looked for help was Clemson University. Tim Davis, Clemson's area-wide fire ant suppression specialist, was invited to an international symposium to educate Taiwanese government officials on fire ant management techniques.

"The role of Clemson's fire ant program has continued to grow in influence in Southeast Asia as fire ants have also been found in Hong Kong, southern China and Okinawa, Japan," said Davis.

In 2005 and 2006 officials from Taiwan National University, the Bureau of Animal and Plant Health Inspection and Quarantine, and Chung His Chemical Company visited Clemson University for hands-on fire ant control training. They toured demonstration sites in South Carolina and other southern states, and met fire ant specialists from Texas A&M, Auburn University, USDA-ARS, USDA-APHIS and Louisiana State University.

For more information: Tim Davis, 803-635-4722, tdvs@clemson.edu, or www.clemson.edu/sandhill/.


Photo by Christine Drais

This tiger quilt by Sheila Gaines is part of the Nature of Quilts on display through December in the S.C. Botanical Garden. Hundreds of perennials, trees, shrubs, ornamental grasses, native plants, and shade plants will be available at the Fall Plant Sale Oct. 6-7. Garden staff and Master Gardeners will be available to help with plant selection and garden design ideas. For more information: www.clemson.edu/scbg/.

Clemson Extension helps clean up Greenwood County

By Diane Palmer

More than 100,000 pounds of litter have been cleared from public roads in Greenwood County since the Pitch In Litter Task Force was formed more than five years ago.

"Litter has a serious negative effect on the economy," said Ernest Church, Clemson Extension community development agent. He and Bob Bentley, former editor of the *Greenwood Index Journal*, worked with volunteers to create the task force.

In addition, Church coordinated an Adopt-A-Highway program with the Probation and Parole Office and the litter officer for the county. "This collaboration has led to a tremendous boast in litter removal," he said.

For more information: Ernest Church, 803-637-3161, echurch@clemson.edu.

Agronomist joins Edisto cropping systems team

A new agronomist has joined Clemson's Edisto Research and Education Center, with research and Extension responsibilities for corn and soybeans.

"Pawel Wiatrak is an excellent addition to our cropping systems team," said Steve Meadows, center director. A native of Krotoszyn, Poland, Wiatrak joined Clemson after 13 years at the University of Florida. He earned an M.S. and a Ph.D. degree in agronomy from Agricultural University in Poznan, Poland.

Landfills become bird sanctuaries

By Peter Kent

For grasshopper sparrows, landfills have become places of refuge, not refuse. Clemson naturalist Drew Lanham has found reclaimed landfills can provide homes for this imperiled species and other birds. On a trip to a landfill, Lanham heard the buzzing insect-like trill of a small, inconspicuous bird – the grasshopper sparrow. He worked with Oconee County solid-waste managers to survey birds on the reclaimed portion of the landfill.

Many species of grassland birds are declining as their habitats, such as pastures and open fields, are lost to development. But there may be novel opportunities for restoration and alternative habitat in places that often are ignored by conservationists.

"The grasshopper sparrow prefers weedy fields and meadows," said Lanham. "Closed landfills are often planted with various weeds and grasses that would seem to provide suitable habitat for the grasshopper sparrow. This bird was once abundant in South Carolina but is now a species of concern."

Lanham's work at the landfill contributed to it being designated as a S.C. Wildlife Federation Wildlife and Industry Together site.

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Photo by Peter Kent

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